

WHAT IS CLAIMED IS:

- 1           1.       A computer implemented method for determining system information, wherein  
2     the system is comprised of at least one host adaptor, at least one switch, and at least one  
3     Input/Output (I/O) device, wherein a path in the system from one host adaptor to the I/O  
4     device includes as path components one host adaptor, one switch, one storage device, a first  
5     link between the host adaptor and the switch and a second link between the switch and the  
6     storage device, comprising:  
7           determining component information on host adaptor, switch, and I/O device  
8     components in a network system;  
9           adding the determined component information to a configuration file providing  
10    configuration information on the network system;  
11          for each determined host adaptor, performing:  
12                  (i) determining, from the component information, information on the first link  
13                  between the host adaptor and the switch;  
14                  (ii) determining, from the component information, information on the I/O device  
15                  to which the host adaptor communicates;  
16                  (iii) determining the second link between the I/O device and the switch; and  
17                  (iv) adding information on the first and second link to the configuration file.
- 1           2.       The method of claim 1, wherein the second link is determined by using the  
2     determined information on the first link and the I/O device to which the host adaptor  
3     communicates.
- 1           3.       The method of claim 1, further comprising:  
2     receiving a request from an application program for configuration information on at least  
3     one component in the system;

4 querying the configuration file to determine the requested configuration information; and  
5 returning the requested configuration information to the application program.

1           4.       The method of claim 1, wherein the component information includes the  
2   address of each component in the system.

1           5.       The method of claim 4, wherein the component information includes a loop  
2 address of each I/O device connecting to a loop that also connects to the switch, wherein the  
3 component information further includes information on multiple loops to which the switch  
4 connects and for each loop, the address of all the devices that are attached to the loop, wherein  
5 determining the second link further comprises:

6 determining one I/O device having a loop address that matches the loop address of one  
7 device attached to the loop to which the switch connects, wherein the second link includes the  
8 loop to which the determined I/O device and switch connect.

6. The method of claim 5, wherein the switch includes multiple destination ports and initiator ports, wherein the initiator ports connect to host adaptors and the destination ports connect to storage devices, wherein the first link includes the initiator port and wherein the second link includes the destination port.

7. The method of claim 4, wherein the switch is comprised of multiple initiator and destination ports, wherein the component information indicates the address of each initiator and destination port in the switch, wherein the information on the first link indicates the initiator port on the switch to which the host adaptor connects and wherein the information on the second link indicates the destination port on the switch to which the I/O device connects, wherein at least one path includes one destination port and initiator port in the switch.

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

1           8.       The method of claim 7, wherein the address of each initiator port comprises the  
2 address of the host adaptor connected to the initiator port, wherein determining the first link  
3 further comprises:

4           determining the host adaptor having the same address as the address of one initiator  
5 port, wherein the first link comprises a connection between the host adaptor and initiator port  
6 having the same address.

1           9.       The method of claim 7, wherein a plurality of destination ports connect to  
2 loops, wherein a plurality of devices are capable of being attached to the loop and wherein  
3 each attached device and the destination port have a loop address on the loop, wherein a  
4 plurality of I/O devices connect to the loops, wherein the component information indicates the  
5 loop address of the I/O devices connected to the loops, and wherein determining the second  
6 link further comprises:

7           for each initiator port, performing:

8                   determining one destination port the initiator port is capable of accessing; and

9                   determining one I/O device having a loop address that matches the loop

10          address of one of the devices attached to the loop to which the determined destination  
11          port is attached, wherein the second link includes the loop to which the determined I/O  
12          device and determined destination port are attached.

1           10.      The method of claim 9, wherein the component information includes a physical  
2 path address for each host adaptor and I/O device, wherein the address of each initiator port  
3 comprises the address of the host adaptor connected to the initiator port, further comprising:

4           determining the host adaptor having the same address as the address of one initiator

5 port, wherein the first link comprises a connection between the host adaptor and initiator port  
6 having the same address; and

7 determining one I/O device having a same physical path address as the determined host  
8 adaptor, wherein the determined host adaptor transfers data to the I/O device having the same  
9 physical path address, wherein the component information associates the destination port with  
10 the initiator port having the same address as the host adaptor that has the same physical path  
11 address as the I/O device to which the destination port connects.

1 11. The method of claim 7, wherein the switch implements the Fibre Channel  
2 protocol.

1 12. The method of claim 1, wherein the I/O device comprises a storage device.

1 13. A system for determining network information, wherein the network is  
2 comprised of at least one host adaptor, at least one switch, and at least one Input/Output (I/O)  
3 device, wherein a path in the network from one host adaptor to the I/O device includes as path  
4 components one host adaptor, one switch, one storage device, a first link between the host  
5 adaptor and the switch and a second link between the switch and the storage device,  
6 comprising:

7 means for determining component information on host adaptor, switch, and I/O device  
8 components in the network;

9 means for adding the determined component information to a configuration file  
10 providing configuration information on the network system;

11 means for performing, for each determined host adaptor:

12 (i) determining, from the component information, information on the first link  
13 between the host adaptor and the switch;

14 (ii) determining, from the component information, information on the I/O device  
15 to which the host adaptor communicates;

- 16 (iii) determining the second link between the I/O device and the switch; and  
17 (iv) adding information on the first and second link to the configuration file.

1 14. The system of claim 13, wherein the second link is determined by using the  
2 determined information on the first link and the I/O device to which the host adaptor  
3 communicates.

1 15. The system of claim 13, further comprising:  
2 means for receiving a request from an application program for configuration information  
3 on at least one component in the system;  
4 means for querying the configuration file to determine the requested configuration  
5 information; and  
6 means for returning the requested configuration information to the application program.

1 16. The system of claim 13, wherein the component information includes the  
2 address of each component in the system.

1 17. The system of claim 16, wherein the component information includes a loop  
2 address of each I/O device connecting to a loop that also connects to the switch, wherein the  
3 component information further includes information on multiple loops to which the switch  
4 connects and for each loop, the address of all the devices that are attached to the loop, wherein  
5 the means for determining the second link further performs:  
6 determining one I/O device having a loop address that matches the loop address of one  
7 device attached to the loop to which the switch connects, wherein the second link includes the  
8 loop to which the determined I/O device and switch connect.

1           18.     The system of claim 17, wherein the switch includes multiple destination ports  
2     and initiator ports, wherein the initiator ports connect to host adaptors and the destination ports  
3     connect to storage devices, wherein the first link includes the initiator port and wherein the  
4     second link includes the destination port.

1           19.     The system of claim 16, wherein the switch is comprised of multiple initiator  
2     and destination ports, wherein the component information indicates the address of each initiator  
3     and destination port in the switch, wherein the information on the first link indicates the initiator  
4     port on the switch to which the host adaptor connects and wherein the information on the  
5     second link indicates the destination port on the switch to which the I/O device connects,  
6     wherein at least one path includes one destination port and initiator port in the switch.

1           20.     The system of claim 19, wherein the address of each initiator port comprises  
2     the address of the host adaptor connected to the initiator port, wherein the means for  
3     determining the first link further performs:  
4                 determining the host adaptor having the same address as the address of one initiator  
5     port, wherein the first link comprises a connection between the host adaptor and initiator port  
6     having the same address.

1           21.     The system of claim 19, wherein a plurality of destination ports connect to  
2     loops, wherein a plurality of devices are capable of being attached to the loop and wherein  
3     each attached device and the destination port have a loop address on the loop, wherein a  
4     plurality of I/O devices connect to the loops, wherein the component information indicates the  
5     loop address of the I/O devices connected to the loops, and wherein the means for determining  
6     the second link further performs for each initiator port:  
7                 determining one destination port the initiator port is capable of accessing; and

8 determining one I/O device having a loop address that matches the loop address of one  
9 of the devices attached to the loop to which the determined destination port is attached,  
10 wherein the second link includes the loop to which the determined I/O device and determined  
11 destination port are attached.

1 22. The system of claim 21, wherein the component information includes a physical  
2 path address for each host adaptor and I/O device, wherein the address of each initiator port  
3 comprises the address of the host adaptor connected to the initiator port, further comprising:  
4 means for determining the host adaptor having the same address as the address of one  
5 initiator port, wherein the first link comprises a connection between the host adaptor and  
6 initiator port having the same address; and  
7 means for determining one I/O device having a same physical path address as the  
8 determined host adaptor, wherein the determined host adaptor transfers data to the I/O device  
9 having the same physical path address, wherein the component information associates the  
10 destination port with the initiator port having the same address as the host adaptor that has the  
11 same physical path address as the I/O device to which the destination port connects.

1 23. The system of claim 19, wherein the switch implements the Fibre Channel  
2 protocol.

1 24. The system of claim 13, wherein the I/O device comprises a storage device.

1 25. An article of manufacture implementing code to determine system information,  
2 wherein the system is comprised of at least one host adaptor, at least one switch, and at least  
3 one Input/Output (I/O) device, wherein a path in the system from one host adaptor to the I/O  
4 device includes as path components one host adaptor, one switch, one storage device, a first

5 link between the host adaptor and the switch and a second link between the switch and the  
6 storage device, by:  
7 determining component information on host adaptor, switch, and I/O device  
8 components in a network system;  
9 adding the determined component information to a configuration file providing  
10 configuration information on the network system;  
11 for each determined host adaptor, performing:  
12 (i) determining, from the component information, information on the first link  
13 between the host adaptor and the switch;  
14 (ii) determining, from the component information, information on the I/O device  
15 to which the host adaptor communicates;  
16 (iii) determining the second link between the I/O device and the switch; and  
17 (iv) adding information on the first and second link to the configuration file.

1 26. The article of manufacture of claim 25, wherein the second link is determined  
2 by using the determined information on the first link and the I/O device to which the host  
3 adaptor communicates.

1 27. The article of manufacture of claim 25, further comprising:  
2 receiving a request from an application program for configuration information on at least  
3 one component in the system;  
4 querying the configuration file to determine the requested configuration information; and  
5 returning the requested configuration information to the application program.

1 28. The article of manufacture of claim 25, wherein the component information  
2 includes the address of each component in the system.



1           29.     The article of manufacture of claim 28, wherein the component information  
2 includes a loop address of each I/O device connecting to a loop that also connects to the  
3 switch, wherein the component information further includes information on multiple loops to  
4 which the switch connects and for each loop, the address of all the devices that are attached to  
5 the loop, wherein determining the second link further comprises:

6           determining one I/O device having a loop address that matches the loop address of one  
7   device attached to the loop to which the switch connects, wherein the second link includes the  
8   loop to which the determined I/O device and switch connect.

1           30.     The article of manufacture of claim 29, wherein the switch includes multiple  
2     destination ports and initiator ports, wherein the initiator ports connect to host adaptors and the  
3     destination ports connect to storage devices, wherein the first link includes the initiator port and  
4     wherein the second link includes the destination port.

31. The article of manufacture of claim 28, wherein the switch is comprised of multiple initiator and destination ports, wherein the component information indicates the address of each initiator and destination port in the switch, wherein the information on the first link indicates the initiator port on the switch to which the host adaptor connects and wherein the information on the second link indicates the destination port on the switch to which the I/O device connects, wherein at least one path includes one destination port and initiator port in the switch.

1           32.     The article of manufacture of claim 31, wherein the address of each initiator  
2     port comprises the address of the host adaptor connected to the initiator port, wherein  
3     determining the first link further comprises:

4 determining the host adaptor having the same address as the address of one initiator  
5 port, wherein the first link comprises a connection between the host adaptor and initiator port  
6 having the same address.

1 33. The article of manufacture of claim 31, wherein a plurality of destination ports  
2 connect to loops, wherein a plurality of devices are capable of being attached to the loop and  
3 wherein each attached device and the destination port have a loop address on the loop,  
4 wherein a plurality of I/O devices connect to the loops, wherein the component information  
5 indicates the loop address of the I/O devices connected to the loops, and wherein determining  
6 the second link further comprises:

7 for each initiator port, performing:

8 determining one destination port the initiator port is capable of accessing; and

9 determining one I/O device having a loop address that matches the loop  
10 address of one of the devices attached to the loop to which the determined destination  
11 port is attached, wherein the second link includes the loop to which the determined I/O  
12 device and determined destination port are attached.

1 34. The article of manufacture of claim 33, wherein the component information  
2 includes a physical path address for each host adaptor and I/O device, wherein the address of  
3 each initiator port comprises the address of the host adaptor connected to the initiator port,  
4 further comprising:

5 determining the host adaptor having the same address as the address of one initiator  
6 port, wherein the first link comprises a connection between the host adaptor and initiator port  
7 having the same address; and

8 determining one I/O device having a same physical path address as the determined host  
9 adaptor, wherein the determined host adaptor transfers data to the I/O device having the same

10 physical path address, wherein the component information associates the destination port with  
11 the initiator port having the same address as the host adaptor that has the same physical path  
12 address as the I/O device to which the destination port connects.

1 35. The article of manufacture of claim 31, wherein the switch implements the Fibre  
2 Channel protocol.

1 36. The article of manufacture of claim 25, wherein the I/O device comprises a  
2 storage device.